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TRANSSCLERAL CONTACT-CYCLOPHOTOCOAGULATION: IS THERE A DOSE-EFFECT CORRELATION?

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Purpose: Transscleral contact-cyclophotocoagulation has been used more and more in the treatment of therapy-refractive glaucomas, in recent years. A less pain sensation, reported by the patients, during treatment in comparison with cyclo-cryocoagulation was one important reason for increased usuage. The dose-effect correlation for exposure time, energy used and number of the laser impacts various according to different authors. This retrospective study tried to determine if there is a dose-effect correlation of the transscleral contact-cyclophotocoagulation.
Methods: 124 eyes of 113 patients (62 female, 62 male, range of age 49,9 ± 26,5 years) were included in this study according to their diagnosis (congenital glaucoma, secundary glaucoma, primary open glaucoma, small angle glaucoma). The used energy, number of laser impacts, exposure time and laserpower were reviewed along with the intra-ocular pressure (IOP) before treatment, after treatment and during the follow-up (mean 6 months). A medication-score was used to register the antiglaucomatous drugs.
Results: 45,2 % (56) of 124 eyes had an IOP of < 22 mm Hg. 25,8 % (32) were treated up to five times. A clinical correlation between energy and decrease of IOP was not found (p_n = 0,0815 non significant, spearmann rank-correlation). The IOP was reduced significantly from 35,8 ± 10,5 mm Hg pre-op to 26,3 ± 10,5 mm Hg at the end of follow-up (p = 0, Wilcoxan-Test). Up to 3 antiglaucomatous drugs could be saved in therapy-refractive eyes to reach an IOP of 21 mm Hg or less.
Conclusions: This data shows that a decrease about 10 mm Hg of the IOP is possible using the transscleral contact-cyclophotocoagulation. In therapy-refractive eyes, less drugs were needed to reach an IOP < 22 mm Hg. Regardless the diagnosis, a dose-effect correlation between the decrease of IOP and laser energy was not found.

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A COMPARATIVE STUDY OF A NEW GLAUCOMA IMPLANT : MESH

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Purpose :To avoid the postoperative hypotony that often occurs after guarded trabeculectomy, glaucoma implants and laser sclerectomy, we designed a new implant, the Mesh, that mimics the physiological trabecular meshwork.
Methods :The Mesh has a T shape and is made of thin porous poly (tetrafluoroethylene) (PTFE). The implant is mounted on a custom-made insertor which allows intrascleral insertion via a 2 mm conjunctival snip incision. The head of the T penetrates in the anterior chamber's angle and the tail is positioned in the subconjunctival space. The flow is created through the pores of the material. The physical properties of PTFE porous membranes with 5 to 80 µm pore size were evaluated in vitro and their microstructure determined by scanning electron microscope. 10, 20 and 50 µm Mesh were selected for a pilot study (30 rabbits, over 3 mos follow-up). A sham study was made on 5 rabbits to evaluate the effect of the surgical procedure without implantation of Mesh. Surgery was performed on the right eye, the left eye served as a control for IOP and outflow measurements.
Results : The flow was function of the material's structure, thickness and density. The 50 and 20 µm had a microfibrillar structure, whereas the 10 µm had a dense structure with pores distributed randomly along the surface. In the sham group, the IOP and outflow returned to normal at POD 14. In the implanted group, surgery took 5-7 minutes. The implant, white at the beginning, became translucent after 5 to 10 days and was found biocompatible. In all cases the IOP was reduced and the outflow increased in the implanted eye during all the time of the follow-up. The 50 µm was biocolonized in 21 days, few cells were present at 3 month in the 20 µm and no colonization was observed in the 10 µm. The tail of all implants was encapsulated at 3 month but the head remained free of encapsulation.
Conclusions : This pilot study revealed that the Mesh and the implantation concepts are well tolerated, less invasive and require less surgical time than most other glaucoma surgical procedures. We demonstrated the efficiency of the Mesh in reducing the IOP and its safety for the eye. The 10 µm Mesh gave the best results of increasing outflow. To minimize biocolonization and to prolong the effect of the Mesh, a thinner implant with smaller pore size is under investigation.

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LONG TERM RESULTS OF THE KRUPIN EYE SHORT VALVE SHUNT

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Purpose: The long term results obtained with the Krupin Eye short valve shunt in 28 eyes with neovascular glaucoma were retrospectively analyzed by means of Kaplan-Meier survival curve.
Methods: The preoperative IOPs ranged from 28 to 62 mmHg (mean, 36.8±5.8 mmHg). Success was considered an IOP of less than 22 mmHg and greater than 5 mmHg without medication (complete success) or with medication (qualified success) without additional glaucoma filtering surgery or devastating complications.
Results: Postoperative success was obtained in 10 out of 28 eyes after a mean follow-up period of 58.4 ± 23.02 months (range, 10-108 months). The 3- and 6-year life-table success rates were 66% and 34%, respectively. Early complications were: shallow or flat anterior chamber (15 patients, 53.6%), hypotony (16 patients, 57.1%), hypertony (7 patients, 25%), serous choroidal effusion (7 patients, 25%), fibrinous uveitis (5 patients, 17.9%), blockage of the intracameral portion of the tube by fibrin (5 patients, 17.9%), choroidal hemorrhage (2 patients, 7.1%). Late complications were: external conjunctival bleb failure (12 patients, 42.9%), blockage of the intracameral portion of the tube by fibrovascular tissue (5 patients, 17.9%), cataract (2 patients, 7.1%), bullous keratopathy (2 patients, 7.1%), external erosion of the Silastic valve (2 patients, 7.1%), phthisis bulbi (2 patients, 7.1%). Mortality during long-term follow-up was high in our series. The complications of an underlying diabetes mellitus were the most common causes of death (15 out of 22 patients).
Conclusions: The high mortality of patients subjected to valve implantation makes it difficult to interpret results of long term studies. However, the valve implant is still today an alternative surgical procedure for controlling IOP in eyes with neovascular glaucoma that have visual potential.

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THE MICROTREPHINE - MULTIPLE PUNCTURES AND LOCAL EFFECTS

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Purpose: Proceeding from the knowledge on corneal foreign body scars with distorsion of the cornea, we found that microtrephinations seem to be able to introduce a new possibility of changing corneal surface.
Methods: To evaluate this hypothesis, we investigated the local changes of the cornea and performed 144 microtrephinations on 12 human cadaver corneas. No perforation occured, 144 samples could be obtained. Light microscopic, TEM and SEM images of samples were prepared to prove handling of small samples and effects of the trephine on the corneal stroma. Heating of the inner puncture site occurs and a small necrosis zone appeared. Measurements of corneal elasticity were taken in cycles from 10 to 100 mmHg pressure. 12 puncture sites on 12 corneas were evaluated. Topographic analysis of defined patterns were evaluated on each cornea.
Results: Flattening of the cornea could be shown after crosslike pattern micropunctures comparable to RK. Opening of the epithelial micropunctures under increasing intraocular pressure was observed. Around the micropuncture sites corneal stroma and descemet is stretched. Elastic properties of the gap are similar to those of RK patterns.
Conclusions: Multiple microtrephinations might produce changes of corneal surface and refraction. Advantages of this procedure are dosage control by repetitive micropunctures, slight peripheral scarring and single stitches in difference to continuous incisions in RK.